

Sustainability as Sales Argument in the Fruit Juice Industry? An Analysis of On-Product Communication

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ABSTRACT

Purpose/Value – The objective of this paper is to determine (1) the extent to which sustainability serves as a sales argument and (2) which areas of sustainability are communicated in the fruit juice industry. This seems promising against the background that there are several ethical challenges the fruit juice chain is increasingly confronted with and consumers demand for sustainable products is also rising.

Design/Methodology – A market investigation at the Point-of Sale (POS) was conducted in July 2013. On-product communication of all fruit juice products ('not from concentrate (NFC)' fruit juices, 'reconstituted (RECON)' fruit juices, fruit nectars and smoothies) from five retailers (two full-range retailers, two discounters, one organic supermarket) was analyzed. The data was evaluated using content analysis.

Results/Findings – Overall, 562 fruit juices were examined. Results reveal that nearly one quarter of the products has labels signaling sustainable aspects. However, most of those products were found in the organic food retailer and are organic juices. Only a small number of products consider other areas of sustainability, such as social concerns or regional production.

Discussion/Conclusion – Communicating sustainability aspects of fruit juice production via on-package labels is scarce in conventional retail stores. In view of the ethical challenges present in the fruit juice chain and discussed in the paper, the increasing demand of consumers for sustainable products and the high competition in the sector, communicating different sustainability aspects can be an opportunity for fruit juice producers and retailers to differentiate their products on the highly saturated fruit juice market.

Keywords: *Sustainability; content analysis; on-product-communication; fruit juice industry*

1 Introduction

In recent years, considerable efforts to promote healthy and sustainable diets have been undertaken at a global as well as at EU-level. Sustainable* consumption is on the international agenda since the early 1990s (Clark, 2007). Political interest in sustainable production and consumption was definitely sparked with the implementation of the United Nations Environment Programme (UNEP)'s program 'Sustainable

* Sustainability has been defined by the UN World Commission on Environment and Development (UNWCED, 1987, p. 17) as 'development which meets the needs of the present without compromising the ability for future generations to meet their own needs'. According to this definition and the outcome document of the UN World Summit 2005, sustainable development policies need to integrate environmental protection, social justice and economic viability (UN, 2005). According to Reheul et al. (2001), sustainable products are products referring to one or several of these aspects.

Consumption' in 1998. Sustainable consumption was also a key focus at the World Summit on Sustainable Development 2012 (WSSD) as well as at the last UN Conference on Sustainable Development in Rio 2012 (UNCSD). Furthermore, the European Commission recently adopted the 'Roadmap to a Resource-Efficient Europe', which calls for incentives for healthier and more sustainable production and consumption of food as an important contribution toward the goal of resource efficiency (EC, 2013).

The increasing awareness of sustainability issues is not only visible on the political agenda. Consumers also show a growing interest in sustainable production and consumption expressed by positive attitudes towards sustainable products and stated purchase intention (de Barcellos et al., 2011; Harris, 2007) as well as a higher willingness to pay for those goods (e.g. Cotte and Trudel, 2009; de Pelsmacker et al., 2005; Langen, 2011). Hence, some consumers do not only request food of high product quality, good taste and reasonable price; they expect their food to be produced in a sustainable way as well (Hartmann, 2011).

Fruit juice plays an important role in everyday consumption of Germans. With almost 82 million citizens and a per capita consumption of 33 liters of juice in 2013, Germany is the leading consumer market for fruit juices worldwide (VdF, 2014). In general, fruits and vegetables have a positive health image which also holds for fruit juices (VdF, 2007). 100% fruit juice is advertised to be part of a healthy diet, e.g. within the 'Five-a-day-campaign', as it is rich in vitamin C and contains e.g. several antioxidants similar to the original fruits (Kraus and Popek, 2013). This image persists despite the fact that especially a high consumption level of fruit juices might promote obesity and dental problems due to the relative high level of natural sugar (fructose) in fruit juices (e.g. Tappy and Lê, 2010).

However, the production and processing of fruit juice is not necessarily sustainable from an environmental and social point of view. Fruit concentrates used in some of the most popular juices are to a considerable extent imported from non-European countries such as China and Brazil and make long distance transports necessary. In addition, inadequate working conditions in the producing countries are a social issue (Stiftung Warentest, 2014; CIR, 2013). In general, the provision of sustainable products offers companies an opportunity for differentiation, thereby creating competitive advantages and image benefits (Balderjahn, 2013; Charter et al., 2002). Responsible sourcing of raw ingredients could thus constitute an important means of product differentiation in the highly saturated fruit juice market. However, consumers can only react to the responsible conduct of firms if such activities are communicated. Communication is most visible for consumers at the Point-of-Sale (POS).

Thus, the overall objective of this study is to investigate to which extent the issue of sustainability is communicated by the fruit juice industry as a sales argument at the POS. To answer the research question and detect the presence or absence of sustainability aspects on product packages, a market investigation was carried out in July 2013 in North Rhine-Westphalia, Germany.

The paper is structured as follows: Firstly, background information about the fruit juice sector and the relevance of sustainability for the sector are provided. In addition, insights into the communication of sustainability via labels and slogans are given. In the third chapter, the study design and analysis are presented, followed by a detailed overview of the results. The last chapter sums up the most important aspects and concludes the paper.

2 Background information

Structure of the fruit juice market in Germany

The fruit juice market is characterized by a diversified structure with producers distributed all over Germany. The total turnover of the German fruit juice industry was 3.4 billion Euros in 2013. Around 7,500 employees worked for about 375 fruit juice manufacturers and produced a total of 3.9 billion liters of fruit juice (VdF, 2014). On the one hand, there is a large number of medium-sized enterprises, processing and often also distributing their products regionally (Gajo, 2005). More than one third of German fruit juice companies report a sales volume of less than 0.26 million Euros. Another 35 companies have a sales volume between 0.26 and 2.56 million Euros. Many of the small fruit juice producers in Germany are well-rooted in local communities and source their commodities locally as well as internationally. On the other hand, a small number of large companies exists (Roeben, 2008). Out of the 375 German fruit juice producers, the eight biggest companies have a total turnover of 2,573 million Euros and a market share of 75% in the year 2013 (VdF, 2014). Another 35 companies gain turnovers of 744 million euro (market share of 21%). This illustrates that despite the considerable number of enterprises in the fruit juice industry, only a few companies capture the majority of the revenues. These facts underline the high degree of concentration in the fruit juice sector (Sennewald and Heitlinger 2012; Roeben, 2008; StBa, 2010). Furthermore, a steady decrease in the number of fruit juice producers can be observed (from

409 in the year 2005 to 375 in the year 2013). The take-over of Pride Foods by Refresco in the year 2013, two big bottlers producing for store and manufacturer brands, illustrates this development (Groh-Kontio Handelsblatt, 2013).

Fruit juice consumption in Germany

Germans are the leading fruit juice consumers worldwide. Even though the annual fruit juice consumption per capita is still high, a decrease of 0.9% from 33.9 liters in 2012 to 33.0 liters in 2013 can be observed (VdF, 2014). This development is seen to be due to the strong dynamics in the beverage sector (Sennewald and Heitlinger, 2012). Segments such as fruit juice spritzer, which are legally considered to be soft drinks, as well as near-water-beverages and energy-drinks, have gained importance in the market (VdF, 2014).

Communicating sustainability via labels and texts or slogans

Due to consumers' growing interest in sustainable food (Baldwin, 2012), companies are facing new challenges and opportunities. Sustainability as a process attribute can serve as a means of differentiation if companies are able to inform consumers about the superiority of their products.

70% of all purchase decisions are made at the POS under the direct influence of the products' packaging and the visual and textual information provided (Frontiers, 1996; Rettie and Brewer, 2000). Thus, POS communication may play an important role in consumers' decision-making processes (Ali and Kapoor, 2009; Dimara and Skuras, 2005; Van der Merwe et al., 2010). Labels can guide the purchase decision by reducing search costs and facilitating identification, e.g. of sustainable products (Galarraga Gallastegui, 2002; Grunert and Wills, 2007). A multitude of product labels indicating sustainable attributes exists in Europe. The eco-label index lists 445 eco-labels focusing on a variety of sustainability-related issues in 2014 (Ecolabelindex, 2014). The existing plethora of sustainability labels on the food market implies the danger of confusing consumers and leaves room for fraud, thereby eroding their overall credibility (Banterle et al., 2013; Fliess et al., 2007; Gerlach and Schudak, 2010; Verbeke, 2008). This holds especially since sustainability labels refer to process characteristics that are credence attributes, such as ecological production methods (Banterle et al., 2013; Roth et al., 2009; Renard, 2003). Thus, while the strength of sustainability labels is their visibility and simplicity, their weakness is their limited credibility. One possibility to gain consumers' trust and to overcome the high degree of information asymmetry is to back those labels up by a third-party certified standard (Albersmeier et al., 2010; Roe and Sheldon, 2007)[†].

Sourcing and its implications for social and environmental aspects of sustainability

Many of the fruit varieties used for fruit juice production, such as oranges, bananas, passion fruits or lemons, are not commercially cultivated in Germany. Chile, South Africa, Brazil, Turkey, New Zealand and Argentina belong to the biggest fruit suppliers exporting those fruits to Germany (BMELV, 2012a; 2012b). But also fruits cultivated in Germany are imported to a considerable extent. This holds for example for the majority of apple juice concentrate. For this product, China is the largest supplier for the German market (Bundestag, 2012). Overall, about 50% of fruits needed for further fruit juice processing are imported to Germany (VdF, 2013).

The carbon footprint of fruit juice is an environmental concern of considerable relevance, not only due to the long distances of the supplier market but also due to high input use, e.g. fertilizer and pesticides, in the production process. A recently published article of the German magazine 'Stiftung Warentest' examined, inter alia, the conditions of orange juice production of 26 different fruit juice products on the German market and determined considerable deficits regarding environmental aspects on fruit plantations (Stiftung Warentest, 2014). Besides the environmental aspects regarding the fruit juice industry, labor standards or rather a lack thereof are a topic of relevance in the cultivation and the processing of fruits (Stiftung Warentest, 2014). For example, the German Christian Initiative Romero (CIR) in cooperation with the United Services Union (ver.di) called attention to the working conditions in the fruit juice sector in 2013 (CIR, 2013). That study analyzes the orange juice production in Brazil, showing systematic disregard of workers' safety, health, and human rights along the entire supply chain. Problems with respect to the working conditions in the fruit producing countries are not limited to Brazil and are not only gaining in importance on the agendas of trade unions, NGOs and other initiatives, they are also increasingly of interest to German politicians (Federal Government, 2012). However, compared to other food sectors, such as the chocolate sector (see Langen and Hartmann, 2012) negative media coverage of the fruit juice sector is rather an exception than the rule.

[†] In fact, one central purpose of those standards is to communicate credible information on product and process characteristics, thereby easing coordination between actors in food chains across space and time (Hartmann et al., 2010).

Given this background, we investigate fruit juice manufacturers' communication of social and environmental product and process attributes via labels and texts or slogans on their products.

Our analysis is guided by the following research questions:

- What is the share of fruit juice products that communicate sustainability aspects via labels and texts or slogans?
- Which aspects of sustainability are communicated?

Recent studies (e.g. van Herpen et al., 2012) have shown that the product positioning on store shelves has a significant effect on sales. Especially items placed on eye-level are more likely to be seen by consumers. Thus, to gain attention and to make consumers aware of products with sustainability labels, they should be placed at such a level. Hence, our third research question is:

- What is the shelf-location of those products?

While in the 1970's, retail brands were low cost alternatives to premium brands of manufacturers (Burch and Lawrence, 2005), the cheap price is no longer their unique selling proposition. With the huge increase of private brands (Wieser et al., 1999) retailers use their own brands to communicate other aspects than 'monetary value for money' e.g. that they have more control over the supply chain and therefore can guarantee a particular quality. For instance, German retailers established organic (e.g. Rewe-Bio and EDEKA-Bio) and Fairtrade private labels (Fairglobe by Lidl) to signal their sustainability commitment. This leads to our fourth research question:

- Do retail brands and manufacturer brands differ in communicating sustainability?

3 Empirical Analysis

3.1 Study design

To reach the aim of the study, a market investigation at the POS was conducted in July 2013. On-product communication of 'not from concentrate (NFC)' fruit juices[‡] 'reconstituted (RECON)' fruit juices[§], fruit nectars and smoothies was analyzed. The examination took place in two full-range retailers and two discounters, which belonged to the top 10 German food retailers according to their total sales in the year 2012 (Lebensmittelzeitung, 2013). Furthermore, one organic supermarket was included in the study to cover a broader variety of retailers. All fruit juice products of those five retailers were considered in the analysis. Fruit juice products were either bought and then photographed from all sides or were directly photographed at the POS. Furthermore, certain details were documented, e.g. regarding placing and facing.

3.2 Methodology

Content analysis as well as semantic network analysis was used to examine on-product communication of fruit juice packaging. For this purpose, a detailed codebook was developed, based on 64 questions with several subtopics including formal and content criteria^{**}. The formal criteria included information about the product with regard to the place of the investigation (including the location, date and retail market), information about the product itself (such as product name, brand, manufacturer or trade name), information on the actual position of the good (such as shelf^{††}, pallet or double placement) and information on the packaging (including packaging material or recycling). Content criteria refer to nutrition labeling, nutrition and health statements, information about the origin of the product, and descriptions with respect to sustainability issues on the packaging. Well-trained and supervised student assistants performed the coding.

A pre-test for the validation of the codebook was conducted as recommended in literature (e.g. Rössler, 2010). For this purpose the assortment of juices from food retailers that are not incorporated in the main study was used. Applying Holsti's method (Holsti, 1969), intercoder reliability for the formal categories

[‡] Juice directly expressed from fruits (not concentrated and reconstituted) also called 'direct juice'. Juices consist of 100% juice (based on FDA, 2014).

[§] Juice which has been concentrated and returned by the addition of water for sale (based on FDA, 2013).

^{**} Not all categories are considered in this paper.

^{††} Studies (e.g. van Herpen et al., 2012) showed that the product positioning on store *shelves* has a significant effect on sales.

was CR=1.0, and for the content categories was CR=0.88. As both lay within the required criteria (values above 0.80 for content categories and values close to 1.0 for formal categories), no revision of the codebook was necessary (Rössler, 2010).

Furthermore, we had a closer look on texts or slogans of the fruit juices packages by means of semantic network analysis. A semantic network is a graph of labelled nodes and edges or a model of semantic relations (Drieger, 2013). Nodes represent objects (categories) and edges stand for relationships between those nodes (categories). To analyze semantic networks, different indicators such as core-periphery, network density and degree based centrality are used. The core-periphery structure is a common equivalence pattern in different fields. Core-periphery analysis divides nodes into two groups, the core and the periphery (Borgatti and Everett, 2000). Core nodes are well connected to other core nodes, while peripheral nodes hardly interact with each other, but with some of the core nodes.

Network density Δ is defined as the ratio of the number of existing edges expressed as a proportion of the number of all possible ones $[N*(N-1)/2]$ (Jansen, 2006).

$$\Delta = \frac{\sum_{i=1}^N \sum_{j=1}^N x_{ij}}{(N * N - 1)} \quad \text{with } i \neq j; x_{ij} = \text{number of links of node (category) } i \text{ to all other nodes in the network.}$$

2

The density values range between 0 and 1, with a density of 1 indicating the existence of all possible combinations in the network. The denser a network, the more overlap exists between the different on-product communication strategies.

The degree (d_i) is an index for the centrality of a node (category) and thus for its importance (Freeman, 1979). The degree indicates the number of links that belong to a node (a category) i (Diestel, 2000).

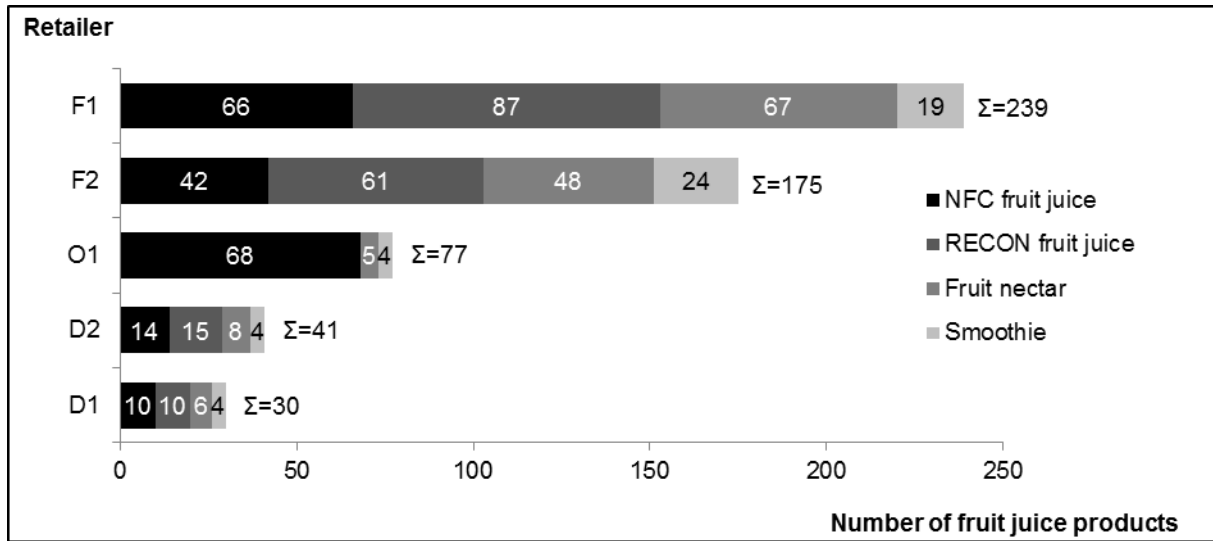
$$C_D(n_i) = d_i = \sum_{j=1}^N x_{ij} \quad \text{with } i \neq j; x_{ij} = \text{number of links of node (category) } i \text{ to all other nodes in the network.}$$

The data was analyzed using the Statistical Package for the Social Sciences (IBM SPSS Statistics 21, 2013) as well as the software UCINET 6 and visualized with the freeware Netdraw (Borgatti et al. 2002; Borgatti, 2002).

4 Results

Results of the market investigation – retail level

In the five selected retailers, a total number of 562 fruit juice products (NFC fruit juices, RECON fruit juices, fruit nectars and smoothies) are identified, including double counting if a product is distributed in several retailers. In detail, the following number of different fruit juice products is offered in the five retail stores: full-range retailer 1 (F1) 239, full-range retailer 2 (F2) 175, discounter 1 (D1) 30, discounter 2 (D2) 41 and the organic supermarket 1 (O1) 77 fruit juice products, respectively (see Figure 1).



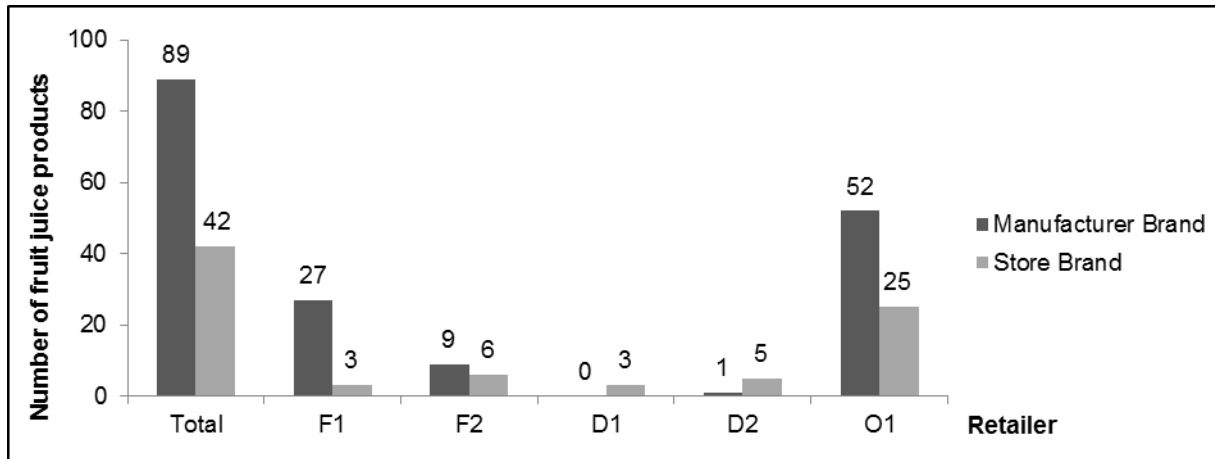
Note: O1 = Organic supermarket 1, D1 = Discounter 1, D2 = Discounter 2, F1 = Full-range retailer 1, F2 = Full-range retailer 2. Source: Own calculation.

Figure 1. Number of fruit juice products in different retailers

Most of the fruit juices available in the five retail stores are NFC juices (36%), followed by RECON fruit juices (31%), fruit nectars (24%) and smoothies (10%) though the respective shares differ considerable between different types of retailers. The organic supermarket offers by far the highest share of NFC fruit juices (88%), while RECON fruit juices are not available at all in that outlet. The share of fruit nectars (6%) and smoothies (5%) is respectively small. In contrast, the RECON fruit juices are dominant in the three other stores (full-range retailer 1, 36%; full-range retailer 2, 35%; discounter 2, 37%). In the case of full-range retailers, fruit nectars have taken second place (full-range retailer 1, 28%; full-range retailer 2, 27%), followed by NFC fruit juices (full-range retailer 1, 28%; full-range retailer 2, 24%) and smoothies (full-range retailer 1, 8%; full-range retailer 2, 14%), while there are more NFC fruit juices (discounter 1, 33%; discounter 2, 34%) than fruit nectars (discounter 1 and discounter 2, 20 %) and smoothies (discounter 1, 13%; discounter 2, 10%) at the discounters.

Overall, 131 products carry labels referring to different sustainable aspects (23%). We grouped together labels referring to regionality, tradition, organic production or GMO-free as well as those making reference to other social or environmental aspects as sustainability labels.^{##} In the organic supermarket all 77 products (100%) have a label referring to sustainability. In contrast, only 9% (full-range retailer 2) to 15% (discounter 2) of the products from the other stores have sustainability labels on the packaging.

^{##} Labels concerning social aspects are for instance Fairtrade, Plan (International non-profit organisation promoting and protecting the rights of children) or Tafel (German non-profit organization delivering food to people in need). Relevant organic and environmental labels are e.g. the European and the German organic label as well as agricultural associations such as Demeter. In addition, some of retailers and manufacturers have individual sustainable labels, advertising their own engagement.



Note: F1 = Full-range retailer 1, F2 = Full-range retailer 2, D1 = Discounter 1, D2 = Discounter 2, O1 = Organic supermarket 1. Source: Own calculation.

Figure 2. Number of fruit juices with sustainability label - manufacturer vs. retailer brands

Figure 2 shows the distribution of manufacturer and store brands in the four different retailers. Most products with sustainability labels are produced by manufacturer brands (89 products, 68% of all products with sustainability label). Nevertheless, the share of retail branded products with sustainability labels relative to all retail branded products is slightly though not significant higher (25%) compared to the respective share for manufacturer products (23%).

Table 1 provides more detailed information with respect to the visibility of sustainability labels between retail and manufacturer brand and regarding the type of fruit juice product for each of the five retail stores. In general sustainability labels are more prominent on manufacturer brands in full-range retailers while the opposite holds for discounters.

NFC fruit juices have by far more labels concerning sustainability aspects on the package (81%) than all other kinds of juices in the sample (see Table 1). The finding still holds if we exclude the products from the organic supermarket. In this case 70% of all fruit juices referring to sustainability are NFC fruit juices.

Table 1.
Amount of fruit juice products with sustainability label – retail level

	Amount of sustainable labeled fruit juice products ^a								Total
	Retail brand				Manufacturer Brand				
	NFC fruit juice	RECON fruit juice	Fruit Nectar	Smoothie	NFC fruit juice	RECON fruit juice	Fruit Nectar	Smoothie	
F1^b	0	3	0	0	21	5	1	0	30 (23%)
F2^b	6	0	0	0	5	2	2	0	15 (11%)
D1^b	2	1	0	0	0	0	0	0	3 (2%)
D2^b	4	1	0	0	0	1	0	0	6 (5%)
O1^b	18	0	3	4	50	0	2	0	77 (59%)
Total	30 (23%)	5 (4%)	3 (2%)	4 (3%)	76 (58%)	8 (6%)	5 (4%)	0	131 (100%)

Note: ^a Number in parenthesis; Percent refers always to the total of sustainable labeled fruit juice products (n=131).

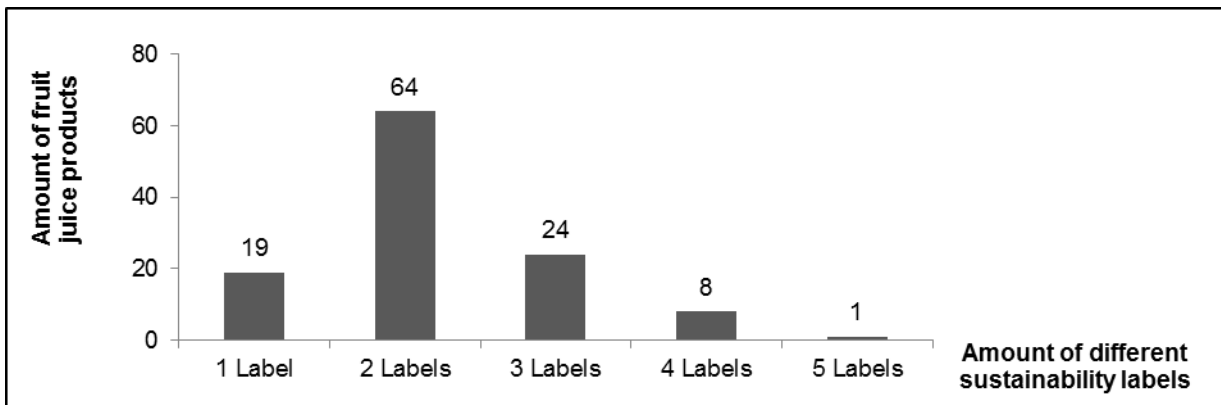
^b F1 = Full-range retailer 1, F2 = Full-range retailer 2, D1 = Discounter 1, D2=Discounter 2, O1=Organic supermarket 1. Source: Own calculation.

Furthermore, regarding the shelf position of fruit juices labeled as sustainable in the different retailers, 36% of the products are positioned at eye-level^{§§} of the consumer and another 34% of the goods can be found on the top shelf.

Product level

After sorting out identical products offered in several supermarkets, 457 different products are identified at product level. 116 of those (25%) have at least one label related to sustainability aspects.

Out of the 116 products with labels referring to sustainability, 65% are manufacturer brands while 35% are retailer brands. Altogether, 256 sustainability labels are shown on these 116 products. In detail, 19 products (12%) have one, 64 (55%) have two, 24 products (21%) have three, eight packages (5%) have four and one juice (1%) has five different sustainability labels on the package (see Figure 3). The same label, occurring on various sides of the packaging, was only counted once.



Source: Own calculation.

Figure 3. Amount of sustainability labels per product

Table 2 summarizes the frequency with which different sustainability labels are used and also provides information on the kind of sustainability aspects communicated together.

Table 2.
Co-occurrence of different sustainability labels on products

	Environmental	Social	Organic	Regional	Traditional	GMO-free
Environmental	(4) ^a					
Social	2	(8) ^a				
Organic	4	5	(97) ^a			
Regional	0	1	1	(7) ^a		
Traditional	0	1	0	0	(11) ^a	
GMO-free	0	0	19	0	0	(19) ^a

Note: ^aTotal number of products bearing the respective labels.

Source: Own calculation.

A total number of 97 products (84%) are identified having labels referring to organic aspects^{***}. All 97 goods have at least one third-party certified label referring to organic farming. 54 products have one, 22 products have two and 22 products have three organic labels on the front side. Additionally to the organic labels, 19 products (16%) have a GMO-free label. 17 of those are on the front side of the package.

^{§§} In this context, at eye-level denotes that the product is positioned about 1.40 to 1.80 meters above the floor.

^{***} Allowing for double counting, the following numbers hold 'EU-label' 96, 'German national-label' 73, 'French national-label' 1, 'US national-label' 1, 'kontrolliert fair Bio genießen-label' 1, 'Naturland' 1, 'Bioland' 3, 'Demeter' 12 and 'retailer own bio label' 14.

Seven juices (6%) provide a label referring to regional aspects^{†††}, 11 products (10%) have a label considering traditional aspects. All products with labels concerning regionality and tradition are retail brands. Four fruit juices depict a label regarding environmental aspects other than an organic label ('Verantwortung für Mensch und Natur'). All labels referring to regionality, tradition and environment are not third-party certified.

Eight products show labels referring to social concerns (four times 'Fairtrade', three times 'Plan' and once 'Tafel'-label). Seven of these products depict the label on the front side of the packaging. The sustainability aspects that are most often communicated jointly are GMO-free and organic (see Table 2).

NFC fruit juices display not only sustainability labels more often as discussed above but also use a wider variety of labels than all other kinds of fruit juice products in the sample (see Table 3).

Table 3.
Overview of fruit juice products with different sustainability labels

	Amount of fruit juice products with a respective label						Total
	Environmental	Social	Organic	Regional	Traditional	GMO-free	
NFC fruit juices	4	4	83	5	5	16	117
RECON fruit juices	0	2	3	1	6	0	12
Fruit nectars	0	2	7	1	0	3	13
Smoothie	0	0	4	0	0	0	4
Total	4	8	97	7	11	19	

Source: Own calculation

Communication of sustainability aspects via texts and slogans

Besides using labels companies can communicate sustainability aspects on their product packaging via slogans or textual information. The analysis shows that more than 64% of the packages are carrying such textual information making reference to sustainability issues. Table 4 illustrates that aspects such as naturalness, quality and health have been emphasized on the product packages. Aspects dealing with organic farming, tradition and control played a moderate role. In contrast, regionality, GMO free, corporate cultures, farming association, social commitment, meadow orchards and Fairtrade were hardly mentioned (see Table 4).

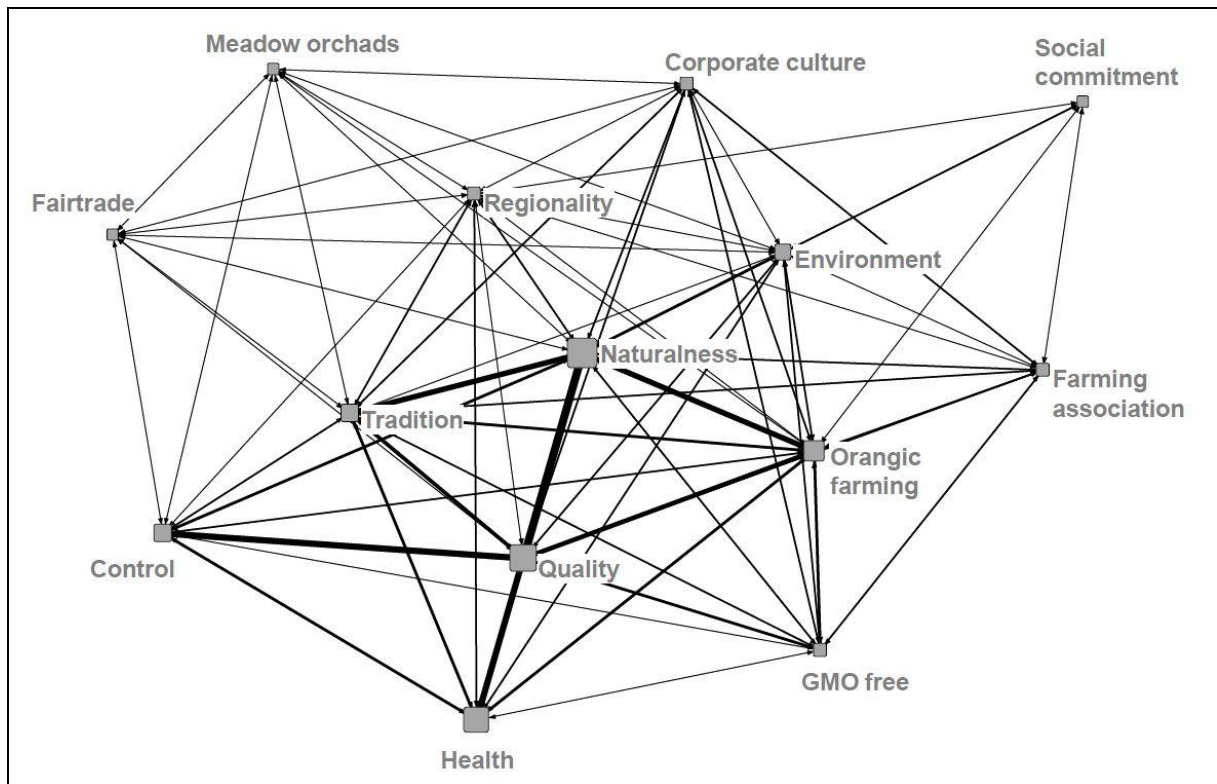
Table 4.
Sustainability categories of text- and slogan-analysis

Category	Example	N (%)
Naturalness	„Each of our varieties contains [...] of nature“	142 (21)
Quality	„[...] ensures the highest quality“	118 (18)
Health	„Vitamins B1 [...] normal energy metabolism“	116 (16)
Organic farming	„Juice made from organic farming“	78 (10)
Tradition	„For more than 100 years“	68 (8)
Control	„Constant monitoring [...]“	51 (7)
Environment	„To support environmental protection [...]“	46 (6)
Regionality	„Apples from the Lake Constance region“	27 (3)
GMO free	„Produced without genetic engineering“	24 (3)
Corporate culture	„Longterm action [...] corporate culture“	20 (2)
Farming association	„Bioland“, „Gäa“	19 (3)
Social commitment	„We are therefore supporting the children's aid organization Plan“	9 (2)
Meadow orchards	„[...] grown on meadow orchards [...]“	9 (1)
Fairtrade	„By implementing fair trading [...]“	8 (1)

Source: Own calculation.

^{†††} Labels named: 'Ein gutes Stück Heimat - Ursprung ist Heimat', 'Geerntet produziert garantiert in Deutschland' and 'Altes Land'.

Figure 4 depicts the network of categories resulting from the analysis of the slogans and texts printed on the product packages.



Source: Own calculation.

Figure 4. Semantic network of categories used in slogans or textual information

According to the spring-embedding algorithm applied, active nodes (i.e. more commonly mentioned concepts) are in the center and less active nodes are rather on the verge of the network (Steinbrink et al., 2013). The core-periphery analysis reveals that the core nodes are naturalness, organic farming, quality and health. Thus, these categories are well connected to other categories. Compared to the density measure of the periphery (2.8), the density of the core of the network (35.0) is quite high, meaning that 35% of all possible relations exist within these four categories. The overall network density in the network is 7.5. Thicker nodes reflect a more frequently mentioning of the category. Thus, naturalness and quality are the most common categories. With a normalized degree of 32.3, the category naturalness is most often connected to other categories in the network, followed by quality (29.1) and organic farming (19.0). In contrast, social engagement (2.1), meadow orchards (2.0) and fairtrade (1.6) have the lowest normalized degree centrality and are therefore of low importance within slogans and textual information.

5 Discussion and Conclusion

This paper deals with the communication of sustainability aspects in the fruit juice sector. In order to gain a better understanding of the research matter, an investigation at the POS was conducted, focusing on on-product communication of all fruit juice products offered in five different retail stores.

Our empirical findings reveal that, at retail level, 23% of the products display labels linked to sustainability on their packages. However, this number is somewhat misleading, as it is highly influenced by the organic retailer in our sample. Excluding this retailer, due to the fact that all fruit juices sold there have at least one sustainability label, the organic label, the share of products with sustainability-related labels drops to 11%. We therefore conclude that in full-range retailers and discounters, the communication of sustainability aspects on fruit juice products via labels is relatively scarce.

Considering the potentially different labeling strategies of retail brands and manufacturer brands we found that there is no difference in the communication intensity via labels.

NFC fruit juices are often perceived as being of higher quality. Labels that refer to sustainable production processes might underline this evaluation. This is in line with our findings, which show that the packages of NFC fruit juices more often reveal labels referring to sustainability than any other type of fruit juice analyzed.

Furthermore, recent studies (e.g. van Herpen et al., 2012) have shown that the product positioning on store *shelves* has a significant effect on sales. Especially items placed on eye-level are more likely to be seen by consumers. Thus, to gain attention and to make consumers aware of products with sustainability labels, they should be placed at such a level. We found that most of the analyzed products with sustainability labels were either placed at eye-level or at the top shelf position.

On product level, the number of different labels linked to various sustainability aspects per product was analyzed. Organic labels in particular are often used together with other labels such as those referring to GMO-free production and/or to social as well as to environmental aspects. This might be due to the fact that a considerable share of the organic products in our sample was offered by an organic retailer. As all products in this store are organic, additional labels are needed to allow for differentiation from competitors. Overall, we find that 84 of the products labeled as sustainable carry at least two different sustainability labels. Nearly 30% of the products have three or more labels on their package. This only refers to different labels on the same package and only to those referring to sustainability. Therefore, the actual number of labels is considerably higher. As consumers have to deal in addition with other on-product information at the POS this might induce the problem of information overload (Wansink et al., 2004). In this case, labels do not inform and simplify the purchase decisions but rather confuse consumers (Banterle et al., 2013).

Third-party certification might be an opportunity to enhance the credibility of labels, (re)gain consumers' trust and overcome the high degree of information asymmetry. Due to governmental regulations organic labels are third-party certified. The situation is quite different with respect to labels referring to regionality^{###}, tradition and environment. Those were all first-party certified.

Regarding slogans and textual information, we found that 64% of the packages carry information that makes reference to sustainability. Compared to the analyzed labels this number is quite high. However, credibility of the textual information is also an issue for the consumer.

Regarding the different aspects of sustainability communicated on the packages via label, slogans or texts, we found that environmental aspects, such as a carbon footprint label, receive hardly any attention, even though carbon emissions play an important role in fruit juice production, processing and transportation. In addition, social aspects are hardly communicated via labels, slogans and texts on fruit juice packages. Only 1% of the products have labels referring to social aspects of production, such as Fairtrade and only 3% of the products mention social aspects (social commitment, 2%; Fairtrade, 1%) in slogans or texts. This might be surprising at first sight, as in other food sectors with a high reliance on imports from developing countries, such as the chocolate industry, those issues are of relevance in on-product communication (Langen and Hartmann, 2012). However, while social issues, such as child labor in the chocolate industry, have raised quite some attention over the last decade, non-governmental organizations have only recently started to focus on the fruit juice sector. Thus, most German consumers are likely not aware of problems linked to poor labor conditions in fruit production in major supplier countries. In many cases consumers might not even know the origins of the fruits for their fruit juices. However, given the recent scandals regarding poor health and safety standards, inappropriate working conditions and low wages in main fruit supplier countries (CIR, 2013), sustainability might gather more relevance for consumers' fruit juice purchase decisions in the future.

Thus, the communication of social aspects via labels or claims can be an opportunity for fruit juice producers and retailers to differentiate their products. Producers taking up those issues at an early stage could benefit from a first mover advantage. However, given the plethora of existing labels and to increase credibility of the information provided, producers may want to rely on well known third party-certified labels.

Our market investigation provides an important contribution to the literature about on-package sustainability communication in the fruit juice sector. Future research is necessary especially in two

^{###} Initial steps have recently been taken to increase transparency for regional products. The so called 'Regionalfenster', have been introduced. It is a nationwide standardized label for regional products. At the time of our POS analysis the label did not exist.

aspects: first, to get a deeper insight into the determinants of companies' on-product sustainability communication and second, to understand the relevance of sustainability labels on fruit juices for consumers' purchase decisions.

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